EAST Search History

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	393	(423/290).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:13
L4	302	(423/299).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:17
L5	313	(423/325).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:25
L6	796	(423/344).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:34
L7	340	(423/409).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:38
L8	414	(423/440).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:43
L9	363	(423/491).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:47
L10	262	(423/509).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:50
L11	294	(423/566.1).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:54
L12	429	(423/592.1).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 18:58
L13	120	(438/403).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 19:00
L14	862	(438/404).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 19:08
L15	1374	(525/420).CCLS.	US-PGPUB; USPAT; EPO; JPO	OR	OFF	2006/06/01 19:08

10/679,247

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     (FILE 'HOME' ENTERED AT 15:47:28 ON 01 JUN 2006)

     FILE 'CAPLUS' ENTERED AT 15:47:47 ON 01 JUN 2006

=> s box nanoparticle
         71675 BOX
         35945 NANOPARTICLE
L1           0 BOX NANOPARTICLE
                 (BOX(W)NANOPARTICLE)

=> s "box-nanoparticle"
         71675 "BOX"
         35945 "NANOPARTICLE"
L2           0 "BOX-NANOPARTICLE"
                 ("BOX"(W)"NANOPARTICLE")

=> s dendron#
L3        1519 DENDRON#

=> s l3 and nanoparticle
         35945 NANOPARTICLE
L4          62 L3 AND NANOPARTICLE

=> s l4 and nanocrystal
          9586 NANOCRYSTAL
L5           3 L4 AND NANOCRYSTAL

=> d 1-3 bib abs

L5   ANSWER 1 OF 3  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2004:924965  CAPLUS
DN   142:97290
TI   Conjugated Oligothiophene-Dendron-Capped CdSe Nanoparticles:
     Synthesis and Energy Transfer
AU   Locklin, Jason; Patton, Derek; Deng, Suxiang; Baba, Akira; Millan,
     Mitchel; Advincula, Rigoberto C.
CS   Department of Chemistry, University of Houston, Houston, TX, 77204, USA
SO   Chemistry of Materials (2004), 16(24), 5187-5193
     CODEN: CMATEX; ISSN: 0897-4756
PB   American Chemical Society
DT   Journal
LA   English
AB   The authors demonstrate the synthesis of branched oligothiophene
     dendrons that act as electroactive surfactants for the capping of
     CdSe nanocrystals through a ligand exchange process.  The number of
     dendrons per nanocrystal and the nature of surface
     coordination interactions were studied in detail using UV-visible, FTIR,
     AFM, and photoluminescence spectroscopies.  These dendron/
     nanocrystal complexes are very soluble in nonpolar solvents and
     exhibit photoinduced charge-transfer interactions between the two species.
     One-layer photovoltaic cells were fabricated that showed initial power
     conversion efficiencies of 0.29%.
RE.CNT  29    THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5   ANSWER 2 OF 3  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2003:757905  CAPLUS
DN   139:266325
TI   Synthesis of stable colloidal nanocrystals using organic dendrons
IN   Peng, Xiaogang; Chen, Haiyan
PA   The Board of Trustees of the University of Arkansas, N.A., USA;
     Nanomaterials and Nanofabrication Laboratories
SO   PCT Int. Appl., 37 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.          KIND    DATE          APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------   --------
PI   WO 2003078699       A2     20030925    WO 2002-US15320        20020514
     WO 2003078699       A3     20040129
     WO 2003078699       C2     20040325
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
             GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
             LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT,
             RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ,
             VN, YU, ZA, ZW
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,
             KG, KZ, MD, RU, TJ, TM, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB,
             GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA,
             GN, GQ, GW, ML, MR, NE, SN, TD, TG
     US 2004101976       A1     20040527    US 2002-146420         20020513
     CA 2446878          AA     20030925    CA 2002-2446878        20020514
     AU 2002367579       A1     20030929    AU 2002-367579         20020514
     EP 1402089          A2     20040331    EP 2002-807072         20020514
         R:  AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
             IE, SI, LT, LV, FI, RO, MK, CY, AL, TR
     JP 2005519836       T2     20050707    JP 2003-576685         20020514
PRAI US 2001-290541P     P      20010514
     US 2002-146420      A      20020513
     WO 2002-US15320     W      20020514
AB   A method for stabilizing colloidal suspensions of nanocrystals or
     nanoparticles in a solvent or solid matrix is provided by coating the
     nanocrystals with bulky organic mols., specifically dendrons.  By
     coating nanocrystals with a dense organic dendron coat and further
     crosslinking the dendron ligands, oxidation of the nanocrystals and
     dissociation of the ligands are avoided.  This invention allows nanocrystals
     to undergo rigorous purification and processing.  It may regularly be applied
     to a variety of nanocrystals.

L5   ANSWER 3 OF 3  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2001:140897  CAPLUS
DN   134:347576
TI   Dendron-controlled nucleation and growth of gold nanoparticles
AU   Wang, Ruiyao; Yang, Jun; Zheng, Zhiping; Carducci, Michael D.; Jiao, Jun;
     Seraphin, Supapan
CS   Department of Chemistry, University of Arizona, Tucson, AZ, 85721, USA
SO   Angewandte Chemie, International Edition (2001), 40(3), 549-552
     CODEN: ACIEF5; ISSN: 1433-7851
PB   Wiley-VCH Verlag GmbH
DT   Journal
LA   English
AB   Dendrons that were focally modified with a metal-coordinating
     functionality can be utilized as stabilizing media for the controlled
     growth of gold nanocrystals enclosed by dendrons.  With
     4-pyridone-based dendrons, gold nanoclusters were obtained that
     are stable for six months both in solution and in the solid state.  The average
     size of the resulting nanoparticles is a direct function of the generation
     number of the passivation dendron, with higher generation
     dendrons producing larger particles.
RE.CNT  26    THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT


=> s wo 2003-us31461/pi
'PI' IS NOT A VALID FIELD CODE
L6             0 WO 2003-US31461/PI

=> s Wang, Y. Andrew/au
L7            10 WANG, Y. ANDREW/AU

=> d 1-10 bib abs

L7   ANSWER 1 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2006:504408  CAPLUS
TI   Highly Luminescent, Stable, and Water-Soluble CdSe/CdS Core-Shell Dendron
```

Nanocrystals with Carboxylate Anchoring Groups

AU Liu, Yongcheng; Kim, Myeongseob; Wang, Yunjun; **Wang, Y. Andrew**; Peng, Xiaogang

CS Nanomaterials and Nanofabrication Laboratories, Fayetteville, AR, 72702, USA

SO Langmuir ACS ASAP
CODEN: LANGD5; ISSN: 0743-7463

PB American Chemical Society

DT Journal

LA English

AB A dendron ligand with two carboxylate anchoring groups at its focal point and eight hydroxyl groups as its terminal groups was found to efficiently convert as-synthesized CdSe/CdS core-shell nanocrystals in toluene to water-soluble dendron-ligand stabilized nanocrystals (dendron nanocrystals). The resulting dendron nanocrystals retained 60% of the photoluminescence value of the original CdSe/CdS core-shell nanocrystals in toluene and were significantly brighter than the similar dendron nanocrystals with thiolate (deprotonated thiol group) as the anchoring group which retained just 10% of the photoluminescence value of the original CdSe/CdS core-shell nanocrystals in toluene. The carboxylate-based dendron nanocrystals survived UV irradiation in air for at least 13 days, about 9 times better than the thiolate-based dendron nanocrystals (35 h) and similar to that of the thiolate-based dendron-box stabilized CdSe/CdS core-shell nanocrystals (box nanocrystals). Upon UV irradiation, the dendron nanocrystals became even 2 times brighter than the original CdSe/CdS core-shell nanocrystals in toluene, and the UV-brightened PL can retain the brightness for at least several months. These stable and bright dendron nanocrystals were soluble in various aqueous media, including all common biol. buffer solns. tested, for at least 1.5 years. In addition to their superior performance, the synthetic chemical of carboxylate dendron ligands and the corresponding dendron nanocrystals is relatively simple and with high yield.

L7 ANSWER 2 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN

AN 2005:66991 CAPLUS

DN 142:312600

TI Bioreactive surfaces prepared via the self-assembly of dendron thiols and subsequent dendrimer bridging reactions

AU Yang, Mandy; Tsang, Emily M. W.; **Wang, Y. Andrew**; Peng, Xiaogang; Yu, Hua-Zhong

CS Department of Chemistry, Simon Fraser University, Burnaby, BC, V5A 1S6, Can.

SO Langmuir (2005), 21(5), 1858-1865
CODEN: LANGD5; ISSN: 0743-7463

PB American Chemical Society

DT Journal

LA English

AB Here, we report a novel route to prepare bioreactive surfaces on gold by the self-assembly of generation-three hydroxyl-terminated dendron thiols (G3-OH) and subsequent bridging reactions using generation-two amine-terminated dendrimers (G2-NH2). It has been shown that G3-OH dendron thiols form a stable and uniform self-assembled monolayer on gold, which can be activated by the homobifunctional cross-linker N,N-disuccinimidyl carbonate (DSC). Subsequent derivatization of the activated monolayer via dendrimer bridging reactions with G2-NH2 enhances the stability, reactivity, and versatility of the prepared surface. Each step of the surface formation reaction has been monitored, and the resulting surface has been characterized by wetting, electrochem., scanning tunneling microscopy (STM), and IR spectroscopy measurements. The reactivity of this surface was demonstrated by a Schiff base coupling reaction with 4-cyanobenzaldehyde, by immobilizing biotin mols. onto the peripheral amine groups using one of the conjugation methods, and by further binding avidin onto the biotinylated surface. We believe that the prepared bioreactive surface with a high d. of amine groups will be useful for the immobilization of biol. macromols. for various biosensor applications, such as the fabrication of DNA microarrays and protein chips.

RE.CNT 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

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L7   ANSWER 3 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2004:311079  CAPLUS
DN   140:340365
TI   Nanocrystals in ligand boxes exhibiting enhanced chemical, photochemical
     and thermal stability, and methods of making the same
IN   Peng, Xiaogang; Chen, Haiyan; Guo, Wenzhou; Wang, Y. Andrew
PA   The Board of Trustees of the University of Arkansas, USA
SO   PCT Int. Appl., 76 pp.
     CODEN: PIXXD2
DT   Patent
LA   English
FAN.CNT 1
     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     ---------------     ----   --------    --------------------   --------
PI   WO 2004031732        A2    20040415    WO 2003-US31461        20031003
     WO 2004031732        A3    20050414
         W:  AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
             CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE,
             GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK,
             LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ,
             OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,
             TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
         RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,
             KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,
             FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR,
             BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG
     AU 2003279807        A1    20040423    AU 2003-279807         20031003
     US 2005004293        A1    20050106    US 2003-679247         20031003
PRAI US 2002-417796P      P     20021003
     WO 2003-US31461      W     20031003
AB   Dendron ligands or other branched ligands with crosslinkable groups were
     coordinated to colloidal inorg. nanoparticles, including nanocrystals, and
     substantially globally crosslinked through different strategies, such as
     ring-closing metathesis (RCM), dendrimer-bridging methods, and the like.
     This global crosslinking reaction sealed each nanocrystal within a dendron
     box to yield box-nanocrystals which showed dramatically enhanced stability
     against chemical, photochem. and thermal treatments in comparison to the
     non-crosslinked dendron-nanocrystals.  Empty dendron boxes possessing a
     very narrow size distribution were formed by the dissoln. of the inorg.
     nanocrystals contained therein upon acid or other etching treatments.

L7   ANSWER 4 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2003:772675  CAPLUS
DN   140:11976
TI   Formation and Stability of Size-, Shape-, and Structure-Controlled CdTe
     Nanocrystals: Ligand Effects on Monomers and Nanocrystals
AU   Yu, W. William; Wang, Y. Andrew; Peng, Xiaogang
CS   Department of Chemistry Biochemistry, University of Arkansas,
     Fayetteville, AR, 72701, USA
SO   Chemistry of Materials (2003), 15(22), 4300-4308
     CODEN: CMATEX; ISSN: 0897-4756
PB   American Chemical Society
DT   Journal
LA   English
AB   The formation of nearly monodisperse CdTe nanocrystals: dots (either zinc
     blende or wurtzite crystal structure), rods, and tetrapods-in a
     noncoordinating solvent was studied.  Several strong ligand effects were
     observed, and the ligand effects on the monomers play a more important role
     than the ligand effects on the nanocrystals.  Exptl. results suggest that,
     instead of monomer concns., monomer activities is a more relevant term for
     understanding the formation of nanocrystals because strong ligands always
     exist in the reaction solns.  The bonding strength and the steric effects
     of ligands dramatically affect the reactivity of monomers and are
     considered as contributors to the activity coeffs. of monomers.  The
     overall optical properties of the as-prepared CdTe nanocrystals are better
     than those reported in the literature and comparable to the standard CdSe
     nanocrystal system.  The configuration of the hydrocarbon chains of the
     ligands on the surface of each nanocrystal also plays a critical role in
     determining the stability of CdTe nanocrystals.
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RE.CNT  49     THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD
               ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7    ANSWER 5 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN    2003:747125  CAPLUS
DN    139:387913
TI    Large-Scale Synthesis of Nearly Monodisperse CdSe/CdS Core/Shell
      Nanocrystals Using Air-Stable Reagents via Successive Ion Layer Adsorption
      and Reaction
AU    Li, J. Jack; Wang, Y. Andrew; Guo, Wenzhuo; Keay, Joel C.;
      Mishima, Tetsuya D.; Johnson, Matthew B.; Peng, Xiaogang
CS    Department of Chemistry & Biochemistry, University of Arkansas,
      Fayetteville, AR, 72701, USA
SO    Journal of the American Chemical Society (2003), 125(41), 12567-12575
      CODEN: JACSAT; ISSN: 0002-7863
PB    American Chemical Society
DT    Journal
LA    English
AB    Successive ion layer adsorption and reaction (SILAR) originally developed
      for the deposition of thin films on solid substrates from solution baths is
      introduced as a technique for the growth of high-quality core/shell
      nanocrystals of compound semiconductors.  The growth of the shell was
      designed to grow 1 monolayer at a time by alternating injections of
      air-stable and inexpensive cationic and anionic precursors into the
      reaction mixture with core nanocrystals.  The principles of SILAR were
      demonstrated by the CdSe/CdS core/shell model system using its
      shell-thickness-dependent optical spectra as the probes with CdO and
      elemental S as the precursors.  For this reaction system, a relatively
      high temperature, .apprx.220-240°, is essential for SILAR to fully occur.
      The synthesis can be readily performed on a multigram scale.  The size
      distribution of the core/shell nanocrystals was maintained even after 5
      monolayers of CdS shell (equivalent to .apprx.10 times volume increase for a 3.5
      nm CdSe nanocrystal) were grown onto the core nanocrystals.  The epitaxial
      growth of the core/shell structures was verified by optical spectroscopy,
      TEM, XRD, and XPS.  The luminescence quantum yield (PL QY) of the
      as-prepared CdSe/CdS core/shell nanocrystals ranged from 20% to 40%, and the
      PL full-width at half-maximum (fwhm) was maintained between 23 and 26 nm,
      even for those nanocrystals for which the UV-visible and PL peaks red
      shifted by .apprx.50 nm from that of the core nanocrystals.  Several types
      of brightening phenomena were observed, some of which can further boost the
      PL QY of the core/shell nanocrystals.  The CdSe/CdS core/shell
      nanocrystals are superior in comparison to the highly luminescent CdSe
      plain core nanocrystals.  The SILAR technique reported here can also be
      used for the growth of complex colloidal semiconductor nanostructures,
      such as quantum shells and colloidal quantum wells.
RE.CNT  48     THERE ARE 48 CITED REFERENCES AVAILABLE FOR THIS RECORD
               ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7    ANSWER 6 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN    2003:524261  CAPLUS
DN    139:210336
TI    Conjugation chemistry and bioapplications of semiconductor box
      nanocrystals prepared via dendrimer bridging
AU    Guo, Wenzhuo; Li, J. Jack; Wang, Y. Andrew; Peng, Xiaogang
CS    Department of Chemistry and Biochemistry, University of Arkansas,
      Fayetteville, AR, 72701, USA
SO    Chemistry of Materials (2003), 15(16), 3125-3133
      CODEN: CMATEX; ISSN: 0897-4756
PB    American Chemical Society
DT    Journal
LA    English
AB    A new strategy, dendrimer bridging, is developed for simultaneous
      formation and functionalization of biocompatible and bioaccessible
      semiconductor box nanocrystals-a dendron box around each colloidal
      semiconductor nanocrystal.  CdSe plain core or CdSe/CdS core/shell
      nanocrystals coated by a monolayer of organic dendron ligands (dendron
      nanocrystals) with hydroxyl groups as the terminal were chosen as the
      starting systems because of their potential biocompatibility and proven
      stability.  A generation-two (G2) amine-terminated dendrimer was used as
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the crosslinking and functionalization reagent, which yielded much more stable cross-linked nanocrystals than the simple diamine or trisamine crosslinking reagents did. The chemical, thermal, and photochem. stability of the resulting amine-terminating box nanocrystals (amine box nanocrystals) formed by dendrimer bridging are comparable to that of the first generation box nanocrystals, achieved by ring-closing metathesis (RCM), that are not biocompatible and need to be further functionalized for bioapplications. As expected, the amine groups on the surface of the box nanocrystals provide versatile and reliable conjugation chemical under mild conditions. Using one of the conjugation methods, biotin mols. were readily coupled onto the amine box nanocrystals. The biomedical applications of those superstable box nanocrystals were demonstrated by the quant. and reproducible precipitation of the picomole amts. of avidin with the biotinylated box nanocrystals. Exptl. results further revealed that the amine box nanocrystals and related derivs. are fully biocompatible to the tested system, have no detectable nonspecific binding, are extremely stable in the desired bioenvironment, and have no noticeable interference with the bioactivities. The exceptional thermal stability further warrants those biocompatible box nanocrystals to be employed in a large temperature range needed for certain applications, such as PCR.

RE.CNT 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7 ANSWER 7 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:183819 CAPLUS
TI Interfacial chemistry of colloidal nanocrystals
AU Aldana, Jose F.; **Wang, Y. Andrew**; Peng, Xiaogang
CS Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR, 72701, USA
SO Abstracts of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003 (2003), INOR-776 Publisher: American Chemical Society, Washington, D. C.
CODEN: 69DSA4
DT Conference; Meeting Abstract
LA English
AB The strength and nature of the bonds between organic ligands and inorg. nanocrystal cores were studied by steady state titrns. Solns. of HCl at fixed pH were prepared and nanocrystals were added. The precipitation was followed by UV-Vis spectroscopy, and equilibrium pH values were obtained for each sample. Coupled with the ligands pKa value, the equilibrium pH allows to calculate stability consts. and bond energies for the ligands on the nanocrystal surface. The results indicate that the stability consts. for the ligands are independent of nanocrystal as well as free ligand concentration in solution The effect on bond strength of several ligand attributes including chain length, bonding headgroup and substituent endgroup was studied. In addition, the effect of nanocrystal core composition on bond strength was also studied.

L7 ANSWER 8 OF 10 CAPLUS COPYRIGHT 2006 ACS on STN
AN 2003:170628 CAPLUS
DN 138:328339
TI Luminescent CdSe/CdS Core/Shell Nanocrystals in Dendron Boxes: Superior Chemical, Photochemical and Thermal Stability
AU Guo, Wenzhuo; Li, J. Jack; **Wang, Y. Andrew**; Peng, Xiaogang
CS Department of Chemistry and Biochemistry, University of Arkansas, Fayetteville, AR, 72701, USA
SO Journal of the American Chemical Society (2003), 125(13), 3901-3909
CODEN: JACSAT; ISSN: 0002-7863
PB American Chemical Society
DT Journal
LA English
AB The surface ligands, generation-3 (G3) dendrons, on each semiconductor nanocrystal were globally cross-linked through ring-closing metathesis (RCM). The global crosslinking of the dendron ligands sealed each nanocrystal in a dendron box, which yielded box-nanocrystals. Although the dendron ligands coated CdSe nanocrystals (CdSe dendron-nanocrystals) were already quite stable, the stability of CdSe box-nanocrystals against chemical, photochem., and thermal treatments were dramatically improved in comparison to that of the original dendron-nanocrystals. also, the box structure of the ligands monolayer coupled with the stable inorg. CdSe/CdS

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     core/shell nanocrystals resulted in a class of extremely stable
     nanocrystal/ligands complexes.  The band edge photoluminescence of the
     core/shell dendron-nanocrystals and box-nanocrystals were partially
     remained, and could be further brightened through controlled chemical oxidation
     or photooxidn. Practically, the stability of the box-nanocrystals is
     sufficient for most fundamental studies and tech. applications.  The
     box-nanocrystals may represent a general solution for the commonly
     encountered instability for many types of colloidal nanocrystals.  The
     size distribution of the empty dendron boxes formed by the dissoln. of the
     inorg. nanocrystals in concentrated HCl was very narrow.  The empty boxes as new
     types of polymer capsules are soluble in solution, mesoporous, and with a very
     thin but stable peripheral.  Those nanometer-sized cavities should be of
     interest for many purposes in the field of solution host-guest chemical
RE.CNT  47    THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7   ANSWER 9 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2002:116456  CAPLUS
DN   136:315466
TI   Stabilization of Inorganic Nanocrystals by Organic Dendrons
AU   Wang, Y. Andrew; Li, J. Jack; Chen, Haiyan; Peng, Xiaogang
CS   Department of Chemistry and Biochemistry, University of Arkansas,
     Fayetteville, AR, 72701, USA
SO   Journal of the American Chemical Society (2002), 124(10), 2293-2298
     CODEN: JACSAT; ISSN: 0002-7863
PB   American Chemical Society
DT   Journal
LA   English
AB   Hydrophilic organic dendron ligands were designed and synthesized for
     stabilizing high-quality semiconductor and noble metal nanocrystals.  The
     focal point of the dendron ligands is chosen to be a thiol group which is
     a universal coordinating site for compound semiconductor and noble metal
     nanocrystals.  The methods for binding these dendron ligands onto the
     surface of the nanocrystals are simple and straightforward.  The thin,
     .apprx.1-2 nm, but closely packed and tangled ligand shell provides
     sufficient stability for the dendron-protected nanocrystals to withstand
     the rigors of the coupling chemical and the standard separation/purification techniques.
     The chemical presented can be immediately applied for the development of a
     new generation of biomedical labeling reagents based on high-quality
     semiconductor nanocrystals.  It also provides an alternative path to apply
     noble metal nanocrystals for developing sensitive detection schemes for
     chemical and biochem. purposes.  The concept may further provide an optimal
     solution for many other problems encountered in nanocrystal-related research
     and development, for which the stability of the nanocrystals is a critical
     issue.  Also, the exptl. results confirmed that the photochem. stability
     of colloidal semiconductor and noble metal nanocrystals is the key for
     developing reliable and reproducible processing chemical for these
     nanocrystals.
RE.CNT  36    THERE ARE 36 CITED REFERENCES AVAILABLE FOR THIS RECORD
              ALL CITATIONS AVAILABLE IN THE RE FORMAT

L7   ANSWER 10 OF 10  CAPLUS  COPYRIGHT 2006 ACS on STN
AN   2001:594815  CAPLUS
DN   135:296102
TI   Photochemical Instability of CdSe Nanocrystals Coated by Hydrophilic
     Thiols
AU   Aldana, Jose; Wang, Y. Andrew; Peng, Xiaogang
CS   Department of Chemistry and Biochemistry, University of Arkansas,
     Fayetteville, AR, 72701, USA
SO   Journal of the American Chemical Society (2001), 123(36), 8844-8850
     CODEN: JACSAT; ISSN: 0002-7863
PB   American Chemical Society
DT   Journal
LA   English
AB   The photochem. instability of CdSe nanocrystals coated by hydrophilic
     thiols was studied nondestructively and systematically in H2O.  The
     results revealed that the photochem. instability of the nanocrystals
     actually included 3 distinguishable processes, the photocatalytic oxidation
     of the thiol ligands on the surface of nanocrystals, the photooxidn. of
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the nanocrystals, and the precipitation of the nanocrystals. At 1st, the thiol ligands on the surface of a nanocrystal were gradually photocatalytically oxidized using the CdSe nanocrystal core as the photocatalyst. This photocatalytic oxidation process was observed as a zero-order reaction in terms of the concentration of the free thiols in the solution The photogenerated holes in a nanocrystal were trapped onto the thiol ligands bound on the surface of the nanocrystal, which initiated the photooxidn. of the ligands and protected the nanocrystal from any photooxidn. After nearly all of the thiol ligands on the surface of the nanocrystals were converted into disulfides, the system underwent several different pathways. If the disulfides were soluble in H2O, then all of the disulfides fell into the solution at the end of this initial process, and the nanocrystals precipitated out of the solution without much variation over their size and size distribution. When the disulfides were insol. in H2O, they likely formed a micelle-like structure around the nanocrystal core and kept it soluble in the solution In this case, the nanocrystals only precipitated after severe oxidation, which took a long period of time. If the system contained excess free thiol ligands, they replaced the photochem. generated disulfides and maintained the stability and solubility of the nanocrystals. The initiation stage of the photooxidn. of CdSe nanocrystals themselves increased as the thickness and packing d. of the ligand shell increased. This was explained by considering the ligand shell on the surface of a nanocrystal as the diffusion barrier of the O species from the bulk solution into the interface between the nanocrystal and the surface ligands. Exptl. results clearly indicated that the initiation stage of the photooxidn. was not caused by the chemical oxidation of the system kept in air under dark conditions or the hydrolysis of the Cd-thiol bonds on the surface of the nanocrystals, both of which were magnitudes slower than the photocatalytic oxidation of the surface ligands if they occurred at all. The results described in this contribution have already been applied for designing new types of thiol ligands which dramatically improved the photochem. stability of CdSe nanocrystals with a ligand shell that is as thin as .apprx.1 nm.

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